OS CONCEPTS WITH LINUX

Main Topics in this Module

- ➔PROCESS AND PROCESS MANAGEMENT
- ➔SIGNAL HANDLING
- ➔FILE AND FILE MANAGEMENT
- ➔INTER PROCESS COMMUNICATION
- ➔PROCESS SYNCHRONIZATION USING SEMAPHORE
- ➔THREADS AND MULTI THREADING
- ➔MEMORY MANAGEMENT

Before going to main topic We should know below things.

.WHAT IS OS

.WHY OS IN EMBEDDED SYSTEMS

.WHY LINUX

.WHAT ARE THE COMPONENTS OF OS

.BOOTING STEPS OF OS

WHAT IS OS

- An operating system is a program that manages the computer Hardware
- It acts as an intermediary between computer user and computer Hardware
- OS provides services for running application on computer system.

WHY OS IN EMBEDDED SYSTEM

- Embedded system is combination of Hardware and Software
- Embedded system is combination of controllers ,sensors,interfaces etc.... to perform given tasks more efficiently with completely or partially independent of human intervention.
- Today embedded systems are doing multitasking.And they are able to take decisions in realtime environment.
- All these thing are possible because now a days embedded systems are using *operating system* in their software part.

WHY LINUX OS

.It is Open source nature.

.Secure.

.Can revive older computers.

.Perfect for programmers.

.Customization.

.Better community support.

WHAT ARE THE COMPONENTS OF OS

.There are two components of OS.

- 1) Applications
- 2) services

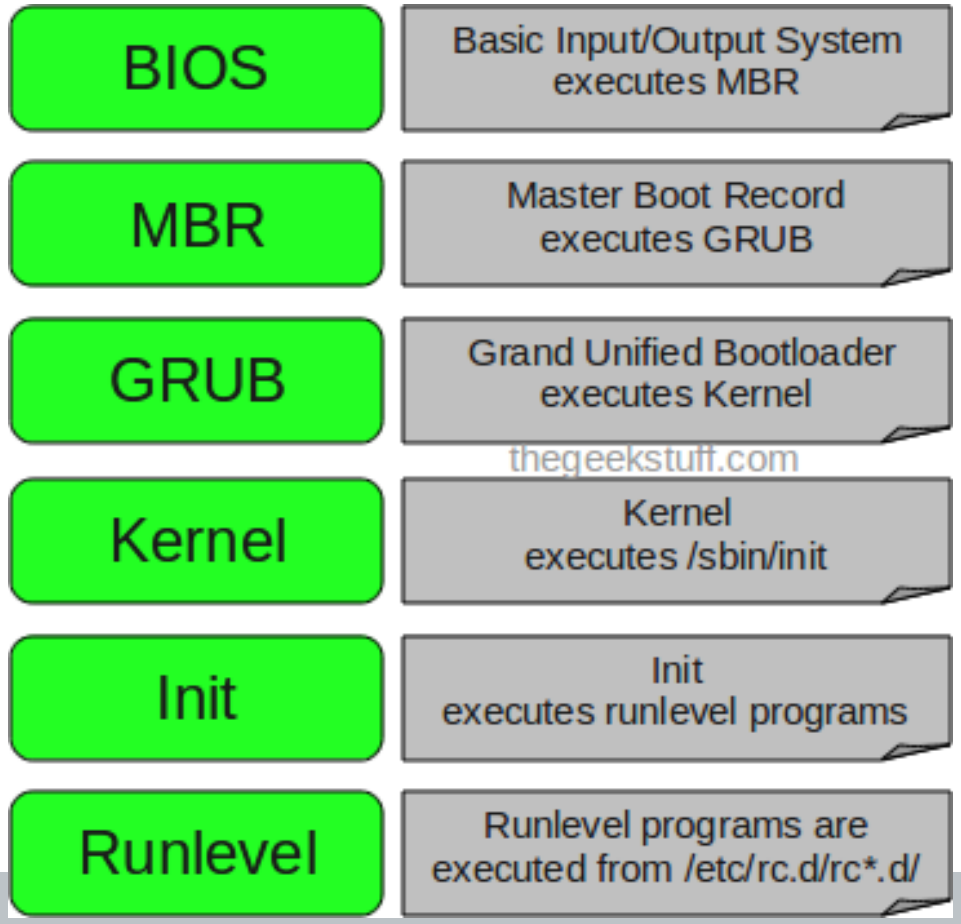
. User uses Applications. And applications need services.

.Applications are optional .Where as services are mandatory.

.Ex: user can use firefox or google chrome or internet explorer for browsing internet. But these apps uses inernet service.

BOOTING STEPS OF LINUX

- From switch on the system to Login screen comes internally 6 steps takes place.



STEP 1: BIOS

.BIOS stands for Basic Input/Output System.

.Performs some system integrity checks.

.Searches, loads, and executes the boot loader program.

.during the BIOS startup to change the boot sequence.

.STEP 2:MBR

.MBR stands for Master Boot Record.

.It is located in the 1st sector of the bootable disk.

.MBR is less than 512 bytes in size.

.It contains information about GRUB.

.So, in simple terms MBR loads and executes the GRUB boot loader.

STEP 3:GRUB

.GRUB stands for Grand Unified Bootloader.

.If you have multiple kernel images installed on your system, you can choose which one to be executed.

.GRUB displays a splash screen, waits for few seconds, if you don’t enter anything, it loads the default kernel image as specified in the grub configuration file.

STEP 4:KERNEL

.Mounts the root file system.

.Kernel executes the /sbin/init program.

.In simple term we can say os is loaded into RAM.

STEP 5:INIT

.Since init was the 1st program to be executed by Linux Kernel, it has the process id (PID) of 1.

.Init identifies the default initlevel from /etc/inittab and uses that to load all appropriate program.

STEP 6 :RUN LEVEL PROGRAMS

.When the Linux system is booting up, you might see various services getting started. For example, it might say “starting sendmail …. OK”. Those are the runlevel programs, executed from the run level directory as defined by your run level.

.In simple term we can say small services start executing in this step.and decides linux runlevel.

Following are the available run levels

0 – halt

1 – Single user mode

2 – Multiuser, without NFS

3 – Full multiuser mode

4 – unused

5 – X11

6 – reboot

If every thing is Done smoothly then Login screen comes.